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10/688,588	10/18/2003	Robert Kincaid	10031032-1	2257

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EXAMINER	
SIMS, JASON M	

ART UNIT	PAPER NUMBER
1631	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/688,588	KINCAID, ROBERT	
	Examiner	Art Unit	
	JASON SIMS	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15,16,21,48 and 65-80* is/are pending in the application.

4a) Of the above claim(s) *15,16,21,48 and 69* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *65-68 and 70-80* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/23/2010 has been entered.

Claim 69 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventive group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 7/1/2010.

Claims 15, 16, 21, and 48 have been withdrawn as being drawn to non-elected subject matter.

Applicant's arguments, filed 11/23/3010, have been fully considered. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Applicants have amended their claims, filed 11/23/2010, and therefore rejections newly made in the instant office action have been necessitated by amendment.

Claims 65-68 and 70-80 are the current claims hereby under examination.

Claim Objections

The objection to claims 65 and 67 for comprising grammatical errors has been withdrawn because of applicant's amendments filed 11/23/2010.

Claim Rejections - 35 USC § 101

Response to Arguments

Applicant's arguments, filed 11/23/2010, with respect to the rejection of claims under 35 USC 101 have been fully considered and are persuasive because of applicant's amendments and arguments. Therefore the rejection has been withdrawn.

Claim Rejections - 35 USC § 112

Response to Arguments

Applicant's arguments, filed 11/23/2010, with respect to the rejections of claims under 35 USC 112 Second Paragraph have been fully considered and are persuasive because of applicant's amendments and arguments. Therefore the rejections have been withdrawn.

The following rejection is being newly applied, which was necessitated by amendment:

Claim Rejections - 35 USC § 112-First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 65-68 and 70-80 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject

matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 65 and all claims dependent therefrom comprise the amended claim wording to further define the limitations regarding sample descriptive values and measurement descriptive values. Support for said amended definitions for said limitations was not found in the specification nor pointed to by applicant. As such it was found to constitute new matter.

The following rejection is being newly applied, which was necessitated by amendment:

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 71 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 71 recites the limitation "positive and negative annotative binary data values" in line 3. There is insufficient antecedent basis for this limitation in the claim. It appears that the limitation references a previous recitation of binary data values, but it is not clear that these are the “positive and negative annotative binary data values," which said limitation in 71 recites. Clarification via clearer claim wording is required.

The following rejection has been modified, which was necessitated by amendment:

Claim Rejections - 35 USC § 103-Modified

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 65-67, 69, 75, and 79-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Warrington et al. (P/N 6,884,578; no. 2 reference in IDS submitted 11/6/2008) in view of Rusterholz (US P/N 5,864,838) in view of Balaban et al. (6,185,561; no. 3 reference submitted in IDS 11/6/2008) and further in view of Tamura et al. (US 2002/0021299) and further in view of Gruenwald (US P/N 2002/0194176).

The claims are directed to a computer-implemented method for displaying and manipulating data, the method comprising:

Storing an ordered data matrix comprising a plurality of measured values representing a plurality of different physical measurements performed on a plurality of samples, a plurality of sample descriptive values corresponding to each sample, and a plurality of measurement descriptive values corresponding to each physical measurement;

Providing a two dimensional detail display having a plurality of cells, each cell corresponding to one of said values in said data matrix, said display providing a view of a portion of said data matrix that is defined by a base location in said matrix;

generating a pseudo-data vector comprising one value for each of said samples;

Re-ordering said data matrix based on a measure of similarity between said pseudo-data vector and measured values of said data matrix; and

Displaying on said display a new portion of said data matrix based on said re-ordering.

With regards to claims 65 and 75: Warrington et al. teach limitations of claim 1 at col. 12, lines 41-67, col. 13, lines 1-38 and col. 25, lines 25-44. Warrington et al. discusses at col. 12 and 13, inputting data items associated with entities to be observed, where the data is arranged in an n x m matrix, as it is stored in tables forming a database or comprising a relational database, which reads on an ordered data matrix. Warrington et al. further teach at cols. 12 - 13 and at col. 14, lines 32-48 different types of data items being stored, such as expression values, which reads on a plurality of

measured values representing a plurality of different data being stored. Warrington et al. further describe at col. 14, lines 32-48, lines 61-67, and col. 15, lines 30-47 that this data can be analyzed by software and interacted with using a graphical user interface to identify patterns and variation. Warrington et al. at col. 13, lines 54-58 describe an illustrated example of a computer system that may be used to execute the software of an embodiment of the invention, wherein the system comprises a display. Therefore, it is inherent that Warrington et al. teach a display used for displaying the tables of data and results of the analysis and data manipulation steps, etc.

Warrington et al. do not explicitly teach calculating a pseudo-data vector, i.e. selecting a row or column, and reordering the data in the matrix based on a measure of similarity between said pseudo-data vector and measured values of said data matrix.

Warrington et al. teach and describe a relational database, wherein it is a recognized property of relational database design that rows or columns can be sorted and reordered based on varying criteria or rules created by the designer.

Rusterholz teaches at the abstract, col. 4, lines 55-67 through col. 8 a method for rearranging tables of data and a reordering module designed to reorder the data in different ways, such as by user input and using “pseudo-data vectors,” i.e. arrays wherein the vector data is used for reordering.

Balaban et al. at col. 3, lines 5-11 teach a query that can be submitted to the relational database tables wherein it extracts information from a matrix of data and can display or sort and thus reorder the data, such as those genes where the gene expression value is greater than or equal to 100. The query, in a sense, selects a set of

data, wherein the selected matched data is equated with having a preset positive value, i.e. selected and the non-matched/selected data will have a null or negative value, thus calculating a pseudo-vector. The stored data is not necessarily in an order from least expression value for a gene to greatest expression value for a gene. Thus the query itself mines the data of those genes whose expression value is greater than 100 and thus reorders the data to be better visualized by a user. Furthermore, Balaban et al. at col. 5, lines 54-56 describes an expression mining database where the user can query and mine the data, wherein the type of querying can vary depending on the user and questions that the user wants to be answered. It is therefore implied that the mining of data as taught by Balaban et al. incorporates the capability of sorting and reordering the expression data as it is a common goal of any data mining to be able to sort and reorder data.

Tamura et al. describes at Fig 7-9 and paragraphs [0017] – [0019] displaying data that has been reordered based on similarity scores.

Gruenwald at the abstract and paragraphs [0009] – [0012] describe known methods of organizing data in a database and describes data being represented as vectors, which are then sorted. Gruenwald describe at paragraphs [0116] – [0118] various embodiments of the data organization for which one particular embodiment is in the medical research and diagnostic fields.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to want to be able to mine data by sorting and reordering the data and have different visualization techniques as taught by Rusterholz, Balaban et al., Tamura

et al., and Gruenwald in the method of Warrington et al. because it can be more effective and is a goal of the researcher to be able to visualize and manipulate data in customizable ways in order to be able to more effectively interpret experimental data. Furthermore, the differences between the claimed invention and the prior art were encompassed in known variations or in a principal known in the prior art.

Balaban et al. at col. 3 and 5 using queries, i.e. pseudo-data vectors comprising numerical data values. Tamura et al. teach reordering the data based on similarity scores wherein the similarity scores are numerical data values. Therefore, the combination of references teach the limitation wherein the generated pseudo-data vector comprises numerical data values as in claim 66.

Rusterholz further teaches at col. 5 using binary data values as in claim 67.

With regards to the limitations of claims 79-80 of transmitting and receiving the resulting data obtained by the method of claim 1: Balaban et al. describe at Fig. 2B a computer network suitable for use in conjunction with the taught invention, which comprises a LAN and computer networks, which inherently have the capabilities of forwarding, transmitting, and receiving data. Balaban et al. further teach that the taught invention formats resulting data for viewing by a user, see claim 1. Thus Balaban et al. teach the method steps of forwarding, transmitting, and receiving resulting data as in claims 79-80.

Response to Arguments

Applicant's arguments filed 11/23/2010 have been fully considered but they are moot in view of the new grounds of rejections stated above.

However with regards to applicant's arguments, applicant alleges that the references do not teach the generation of a pseudo-data vector nor reordering the data based on a measure of similarity between the pseudo-data vector and measured values in data matrix.

Applicant at paragraph [0064] of the published specification describe a pseudo-data vector as a vector containing pseudo values based on inputs by a user of the system which is constructed for performing similarity sorts against actual data vectors. In other words, any data used by a user to perform a similarity sort, reads on a pseudo-data vector.

Applicant's arguments are not found persuasive because as described above Rusterholz, and at Fig. 5, describes using user input for rearranging data in tables, which reads on using pseudo-data vectors for rearranging data. Tamura et al. and Gruenwald teach organizing data in databases, wherein methods of sorting based on similarity scores are known in the art. Thus the combination of references as described above teaches the instantly argued claim limitation.

Applicant further argues that because a reference can be modified is not sufficient to sustain a rejection and that there is no motivation to modify the references cited.

Applicant's arguments are not found persuasive as the number of references cited exemplifies the known use of different techniques for manipulating and organizing data. For example, Gruenwald as described above, teaches that it is common to look to known techniques of data manipulation for use in current application of data

manipulation and organization. Tamura et al. describes sorting based on similarity scores and displaying the data wherein displaying data sorted by similarity score. Tamura et al. at paragraph [0012] describes how the data manipulation based on similarity scores makes analysis easier and more intuitive. Thus applying the known techniques and combining is motivated by making display analysis easier and more intuitive as described by Tamura et al. Therefore, those of ordinary skill in the art would have looked to known potential solutions with motivation and applied them wherein the results would have been predictable.

Applicant alleges that the data mining via queries is not equivalent to assigning numerical data values as specified and that there is no teaching include sample descriptive values and that the mining results in the generation of a pseudo-data vector.

Applicant's allegations are not found persuasive as Tamura et al. teach assigning numerical data values, via the figs of the tables. The use of a query to mind data and/or the reorganization of data in a table based on values in the table causes the generation of a pseudo-data vector per applicant's definition in the published application. Thus claim 66 is taught by the combination of references as further described in the Office Action above.

Applicant alleges that the teachings of Rusterholz cannot be interpreted to be sample descriptive values as recited.

Applicant's allegations are not found persuasive as Rusterholz shows it is obvious to represent data in binary form, wherein the use of binary numbers to have

represented the sample descriptive values would have been an obvious use of a known technique as described above.

Claims 68, 70-72, and 76-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Warrington et al. (P/N 6,884,578; no. 2 reference in IDS submitted 11/6/2008) in view of Rusterholz (US P/N 5,864,838) in view of Balaban et al. (6,185,561; no. 3 reference submitted in IDS 11/6/2008) and further in view of Tamura et al. (US 2002/0021299) and further in view of Gruenwald (US P/N 2002/0194176) as applied to claims 65-67, 69, 75, and 79-80 above and further in view of Balaban et al. (US A/N 2003/0028501) and further in view of Warrington et al. (US 2003/0124539).

Warrington et al., Rusterholz, Balaban ('561), and Tamura and Gruenwald teach claims 65-67, 69, 75, and 79-80 as described above.

The combination of references suggest, but do not explicitly teach the limitations of claims 68 wherein color-coding particular cells is taught.

The references suggest this because they teach various forms of manipulating and displaying data. For instance, Balaban et al. ('501) teach at paragraphs [0066]-[0069] displays may be in various forms, such as bar graphs, histogram graphs wherein a user can specify options such as range and color, etc. Therefore, using color as a way of displaying and manipulating data is recognized by Balaban et al. ('501).

In addition Tamura et al. at paragraph [0016] teach using different depths of color to represent hybridization levels.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to have used color for displaying as taught by Balaban et al. (‘501) for color-coded cells of at least one row of data in the method taught by Warrington et al, Rustherholz, Balaban ('561) and Tamura et al. and Gruenwald. This is because using color as a way of displaying and manipulating data is recognized by Balaban et al. (‘501) and Tamura et al. as a functionality used in data manipulation and displays by those of ordinary skill in the art. Therefore, the differences between the claimed invention and the prior art were encompassed in known variations or in a principal known in the prior art. Furthermore, one of ordinary skill in the art would have recognized that the results of the combination were predictable.

With regards to limitations of claims 70-72 and 76-78: Balaban et al. (‘501) teach at Figs. 4A and 9A-9F and paragraph [0045] an LIMS system comprising a database of annotative data. Balaban et al. (‘501) further teach at paragraph [0071] that the annotations can be user defined, which further reads on applicant’s definition of a pseudo-vector at paragraphs [0012]-[0013] wherein a user input may be provided for, wherein a user or the system may input predetermined values to be substituted for the descriptive data values and a pseudo-vector may be calculated from arbitrary data input from a user. The annotation query, in a sense, selects a set of data, wherein the selected matched data is equated with having a preset positive value, i.e. selected and the non-matched/selected data will have a null or negative value, thus this step assigns data values to the annotative data items. Balaban et al. ('501) describes filtering, i.e. sorting the data, to form a result that is displayed, wherein the filtering is done according

to one or more user specified factors of interest. Furthermore, Balaban et al. ('501) teach wherein the benefits of the present filtering can be less complex and substantially easier for clear viewing.

However, Warrington et al. (2003) at paragraphs [0006] and [0008] describe representing and assigning data representing sample descriptive data explicitly as null values. The null values taught by Warrington et al. (2003) can be used to substitute for unknown or non-existant, i.e. negative values for the data.

Gruenwald further teach at paragraph [0122] filtering based on positive and negative relationships, which reads on data that emphasizes and/or de-emphasizes values.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to have used null values as taught by Warrington et al. for use in a method for data manipulation as taught bye the combination of Warrington et al., Rusterholz, Balaban (‘561), and Tamura and Gruenwald and Balaban (‘501). This is because Warrington et al. teach that the use of null value for representing data is routine for the skill artisan. Thus one of skill in the art could have pursued the known potential solutions with a reasonable expectation of success, such as to have clearer viewing of the data as taught by Balaban et al. (‘501). Furthermore, the differences between the claimed invention and the prior art were encompassed in known variation or in a principal known in the prior art.

Rusterholz teach at Fig. 6 wherein inverting the data is a known technique used by the skilled artisan for data manipulation as in claim 72.

Response to Arguments

Applicant's arguments filed 11/23/2010 are moot in view of the new grounds of rejections.

However with regards to applicant's arguments that a predefined null value and assigning it to a cell lacking a sample descriptive value is not taught, Warrington et al. as described above teach substituting values with a null value to represent the data, wherein a null value de-emphasizes the data value.

Applicant further argues that none of the references teach inverting the data values.

Applicant's arguments are not found persuasive as Rusterholz teach at Fig. 6 wherein inverting the data is a known technique used by the skilled artisan for data manipulation as in claim 72.

Applicant further alleges that because substituting is not taught that claim 76 is further clear of the prior art.

Applicant's allegations are not found persuasive as Warrington et al. (2003) teach assigning a null value to a sub-portion for de-emphasizing. Applicant's arguments are further not found persuasive as Greunwald teach methods for emphasizing and de-emphasizing data values, wherein the differences between the prior art and the claimed method were encompassed in known variations or in a principal known in the prior art.

Claims 73-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Warrington et al. (P/N 6,884,578; no. 2 reference in IDS submitted 11/6/2008) in view of Rusterholz (US P/N 5,864,838) in view of Balaban et al. (6,185,561; no. 3 reference submitted in IDS 11/6/2008) and further in view of Tamura et al. (US 2002/0021299) and further in view of Gruenwald (US P/N 2002/0194176) as applied to 65-67, 69, 75, and 79-80 above and further in view of Schadt et al. (US P/N 7,035,739).

Warrington et al., Rusterholz, Balaban ('561), and Tamura et al. and Gruenwald teach claims 65-67, 69, 75, and 79-80 as described above.

The combination of references set forth above suggest, but do not explicitly teach calculating a distance value between rows assigned a similarity value wherein the calculation is a Euclidean distance as in claims 73-74.

The references suggest this because Warrington et al. at col. 27, lines 25-44 discuss data items based on gene expression data, but derived from GeneCluster software analysis. For example, GENECLUSTER performs a data analysis that involves clustering data such as hierarchical clustering, Bayesian, and k-means clustering wherein these types of clustering methods calculating a distance based on a Euclidean distance is commonly used and well known methods.

Schadt et al. teach starting at col. 8, lines 21-47 using a Euclidean distance is a well known statistical method in the art. Furthermore, Schadt et al. teach at col. 11, lines 3-27 using data stored in a database to perform the data manipulation step.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to have calculated a distance using an Euclidean distance, or a squared Euclidean distance as taught by Schadt et al., in the method made obvious by Warrington, Rusterholz, Balaban, and Tamura et al. and Gruenwald for manipulating data. This is because one of ordinary skill in the art would find the differences between the claimed invention and the prior art were encompassed in known variations or in a principal known in the prior art. Furthermore, one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Response to Arguments

Applicant's arguments filed 11/23/2010 are moot in view of the new grounds of rejections.

However with regards to applicant's arguments, applicant further argues that the fact that certain measures of distance are known in clustering theory, such as calculating Euclidean distance, does not make those measures obvious as criteria for ordering records.

Applicant's arguments are not found persuasive as Balaban and the combination of references provides motivation for manipulating data in different ways, such as by the

use of known methods as calculating distances as described below in the instant Office Action.

Conclusion

No claim is allowed

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Sims, whose telephone number is (571)-272-7540.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Marjorie Moran can be reached via telephone (571)-272-0720.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the Central PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The Central PTO Fax Center number is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/ Jason Sims /